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26-10 Global economic implications of the 2026 Middle East war

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ABSTRACT

This paper explores two scenarios for the potential economic effects of a Middle East war that causes a spike in energy prices. In the first, oil prices surge for one year to around $120 per barrel, while prices also rise sharply for liquefied natural gas, refined petroleum, and fertilizer: in the second, energy prices remain elevated for three years. We find in both scenarios, global growth slows relative to our baseline projection, but the effects are felt very unevenly. Countries dependent on Middle Eastern oil, petroleum, natural gas, and fertilizers experience the largest declines in GDP and increases in inflation. The effects on different sectors vary according to their energy sources, both directly through different energy dependence and indirectly through production networks. Also, trade relationships matter because as the global economy slows, countries such as China experience a decline in export demand, worsening GDP losses, even though China has large domestic supplies of oil, gas, and fertilizer.

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On February 28, 2026, Israel and the United States launched an attack on the Islamic Republic of Iran. One Iranian response was to close the Strait of Hormuz, a narrow passageway through the Persian Gulf through which approximately 20 percent of the world's oil and liquified natural gas (LNG) transits. While both Saudi Arabia and the United Arab Emirates (UAE) can move oil through pipelines to avoid the Strait, these have limited capacity relative to normal shipping volumes. The International Energy Agency (IEA) coordinated the release of 400 million barrels of emergency oil reserves, but these reserves are small relative to the global market, and such releases cannot be sustained for an extended period.

Oil prices have been volatile, rising and falling on rumors of peace or renewed conflict. The price, which had been $73 per barrel (Brent crude) before the war, peaked at $138 in early April (figure 1). Since then, oil prices have fallen back and were traded around $100 by early June.

Figure 1

Oil prices surged in 2026 due to war in the Middle East
Brent crude oil prices, US dollars per barrel

Source: U.S. Energy Information Administration (Spot Prices for Crude Oil and Petroleum Products).

The price of nitrogen fertilizer, which uses oil and natural gas as feedstocks, has risen by 30–50 percent, depending on the product and location. Urea prices rose by more than 50 percent at their peak and were up 45 percent year to date as of May.[1]

Higher fertilizer costs are expected to adversely impact food production. Energy-intensive activities, such as data center operations and the processing of critical minerals, could also be affected. Helium, a byproduct of LNG production in the Middle East, is also experiencing shortages that could affect semiconductor production. We assume an average price of $120 per barrel, which could be high or low. The results can be scaled if the reader has an alternative scenario in mind.[2]

If hostilities were to cease and the Strait reopened to shipping, prices could return to more normal levels relatively quickly.[3] But other scenarios are more concerning. Available reserves are not large relative to the world market, and there are limited opportunities to bring more supply online from producers outside the affected Gulf region, apart from the United States. However, a prolonged closure of the Strait, together with the destruction of oil and LNG production and transportation infrastructure, could lead to sustained elevated prices until producers outside the region can bring more supply online.[4] Additionally, the very fact

1 https://tradingeconomics.com/commodity/urea.

2 JP Morgan on March 13 assumed $100 per barrel. Two weeks later, on March 30, Bloomberg (2026) commented: "US government officials and Wall Street analysts are starting to consider the prospect that oil prices might surge to an unprecedented $200 per barrel."

3 Hendrix (2026) provides estimates of normalization times: spot oil (1–2 months); war risk insurance (2–4 months); undamaged LNG (3–6 months); damaged LNG (3–5 years); sulfuric acid (3–6 months); undamaged aluminum (4–8 months); damaged aluminum (2–5 years); fertilizer/urea (6–12 months); copper/nickel processing (6–12 months); food prices (Q1 2027 shock, 12–18 months).

4 A March 2026 Iranian missile attack on the world's largest LNG export hub in Qatar required the government to declare force majeure on 17 percent of capacity for 3–5 years.

that Iran was able to close the Strait may create a persistent, if not permanent, risk premium on shipping transiting the Strait, even after it is re-opened.

Other studies have explored a range of scenarios. The International Monetary Fund's (IMF) April World Economic Outlook (WEO) explored three scenarios. A "reference scenario" assumes that war-related economic disruptions fade by the middle of 2026 and that oil prices average about $82 per barrel in 2026. An "adverse scenario" assumes that oil and natural gas prices increase by 80 percent and 160 percent, respectively. In this scenario, oil prices average about $110 per barrel in 2026, but the IMF has a baseline value of $60 per barrel. The third "severe scenario" is calibrated to larger and more persistent shocks. Oil prices are assumed to be 100 percent and LNG prices 200 percent higher than the January 2026 WEO Update.

An even more sustained energy shock is conceivable, as argued by Darren Lim (2026). After the initial stage of bombing, the closure of the Strait of Hormuz has meant that the war is unlikely to end without negotiation. Violence offers no effective solutions on either side in this specific situation. Both sides view events so far as victories for themselves, so their capacity to accept a negotiated outcome that involves significant compromise is extremely limited. Hence, negotiations will be very protracted. Once the war ends, it is unlikely that global energy markets will return to their previous state. The continued undermining of international institutions and the reputational damage caused by a US administration that demonstrates a capacity to repudiate treaties or negotiated agreements, as well as the undermining of the Organization of the Petroleum Exporting Countries' (OPEC) ability to stabilize oil prices, mean that global energy markets will likely have higher risk premiums in pricing and production location decisions over time.

In this paper, we examine two alternative scenarios for the conflict's impact on the global economy that differ in the duration of supply disruption. The scenarios start with crude oil at $72 per barrel before the war began and are as follows:

- A one-year disruption in which oil prices surge 66 percent to $120 per barrel, LNG prices double, prices for refined petroleum rise 75 percent, and agricultural productivity falls 3 percent due to shortages and higher prices for fertilizer.

- A three-year disruption with the same 2026 disruption as in the first scenario, but with an additional shock in 2027 half the size of the 2026 shock, and another shock in 2028 half of the size of the 2027 shock.

We find that even a temporary shock exerts a drag on the global economy. But the income and inflation effects vary considerably across regions, depending on central banks' responses, the dependence on endowments of energy, economic structures, reliance on energy from the Middle East, and spillover effects on production networks within and across countries. We assume central banks follow a Henderson-McKibbin-Taylor style rule[5] and adjust nominal interest rates to stabilize the gap between gross output and potential gross output growth relative to the baseline, as well as attempting to stabilize the change in inflation relative to the inflation in the baseline without the shocks. Some countries (such as China) also partially adjust monetary policy to stabilize changes in the nominal exchange rate relative to the US dollar. Details on the exact parameters for each country can be found in the model documentation. While gross output is falling in the US as a result of the oil shock, the rise in inflation is not completely offset due to falling output. It is quite plausible that central banks could overreact or underreact to the change in inflation, which could accentuate or dampen the fall in real output.

We also ignore any policy responses that attempt to offset the price effects through changes in energy subsidies in different countries. US GDP is projected to be slightly more than 1 percent lower than it would otherwise be in 2026. In Asia, however, South Korea, India, Vietnam, and Thailand are the most economically affected, with GDP 2.8 percent to 3.2 percent lower than baseline.

5 See Henderson and McKibbin (1993) and Taylor (1993).

MODELING THE IMPACT OF THE WAR

Recent empirical work has sought to identify and quantify the macroeconomic effects of geopolitical oil price shocks using high-frequency and econometric approaches. Verduzco-Bustos and Zanetti (2026) develop a novel instrumental-variable strategy within a proxy vector autoregression (VAR) framework to isolate oil price movements associated with episodes of heightened geopolitical risk. Their results show that such shocks resemble severe oil supply disruptions, generating sharp increases in oil prices, declines in production, and significant spillovers to global output and inflation, particularly in energy-importing economies.

The analysis in this paper is complementary but methodologically distinct. While Verduzco-Bustos and Zanetti (2026) identify shocks from historical data, we impose explicit, forward-looking scenarios within a structural multi-country model (G-Cubed) to trace the transmission of alternative geopolitical outcomes. This approach allows us to examine not only the short-run responses identified in the empirical literature, but also the medium- and long-run adjustment paths under different assumptions about the duration and persistence of supply disruptions.

To understand the implications of the war on the global economy, we use the G-Cubed model to analyze the two alternative scenarios outlined above. The G-Cubed model is a hybrid of dynamic stochastic general equilibrium (DSGE) models and computable general equilibrium (CGE) models developed initially by McKibbin and Wilcoxen (McKibbin and Wilcoxen 1999, 2013).[6]

Importantly, G-Cubed has significant disaggregation of production within each economy across the twelve sectors: electricity delivery, gas extraction and utilities, crude oil extraction, petroleum refining, coal mining, construction, other mining, agriculture, durable manufacturing, nondurable manufacturing, transportation, and services. G-Cubed also models bilateral trade and capital flows by sector and country. Hence, the source and type of energy disruption both play important roles in the results. The

6 Country and sectoral coverage, along with other details, are available in Appendix A and online at https://documentation.gcubed.com.

degree of disaggregation across countries and sectors makes this version of the G-Cubed model more suitable than reduced-form macroeconomic models that focus solely on energy.

In each country, consumers comprise a subset of households that maximize intertemporal utility while the remaining households are liquidity-constrained, spending their current income. Firms in each sector of each country produce goods using the primary factor inputs, capital (K) and labor (L), as well as intermediate inputs, energy (E), and materials (M), which are themselves produced from inputs of individual commodities. Energy is disaggregated into oil extraction, refined petroleum, natural gas (LNG), coal, and electricity generation. In addition, petroleum products such as fertilizers are included among the material inputs from the nondurable manufacturing sector in the model. These production linkages exist both within and across countries. Different types of energy play different roles in different sectors across countries.

We use G-Cubed to generate a baseline projection of the global economy over the coming decades, assuming energy markets are not disrupted. We then project the war's effects, measured as deviations from that baseline. In constructing the scenarios, we have developed three broad shocks:

- a decline in the supply of crude oil, refined petroleum, and natural gas (aimed at achieving an initial 66 percent rise in the price of oil in 2026);
- an additional price wedge that increases the price of primary energy imports from the Middle East in an effort to approximate the actual energy import price shocks as of April 30; and
- a negative shock to productivity in the agriculture sector in countries importing fertilizers. While fertilizers are part of the nondurable manufacturing sector, their impact is diluted by aggregation. An additional direct shock to agriculture more accurately captures the potential direction of the sector due to supply shortages and higher costs.[7]

7 The IMF's April WEO includes a 5 percent shock to food prices in their severe scenario. This is not directly comparable with the change in productivity in agriculture that we assume in our scenarios because agriculture is more than food production in the G-Cubed model.

To aid understanding of the results, table 1 (pages 9–11) shows the shares of total consumption of crude oil, refined petroleum, and LNG that are imported, as well as the share of imports originating in the Middle East and the overall reliance on the Middle East for total energy. This table gives a first-round indication of the likely impact of the shocks. The first-round impacts are reinforced by second-round effects associated with the energy and fertilizers used by countries as they enter production networks. The United States and Canada do not rely on Middle Eastern energy, but they do rely to some extent (especially the United States) on the Middle East for fertilizers (not shown), and are affected by price increases in global energy and fertilizer markets. Much of the oil produced in the Middle East is shipped to regions to the east, which have felt the impact of the conflict most acutely (and justifies the relatively detailed reporting on Asian countries in the next section of the paper). In northeast Asia, both Japan and Korea rely heavily on Middle Eastern crude oil and petroleum, but both countries are less dependent on the Middle East for LNG, which is largely sourced from Australia (they also rely on the Middle East for fertilizer, but they are not major agricultural producers). China is also less reliant on the Middle East than other countries in the region. Australia and New Zealand have moderate levels of reliance on the Middle East for crude oil, petroleum, and fertilizer, but no reliance on LNG. However, they do rely on refined petroleum from Singapore and Korea, which in turn relies heavily on crude oil from the Middle East (not captured in table 1 but is captured in the model). India is particularly reliant on fertilizer (not shown), crude oil, and LNG. In Southeast Asia, there is moderate reliance on oil, petroleum, and fertilizer (not shown) from the Middle East, but less so on LNG, again because Australia is their major supplier.

Table 1

Energy Dependency, 2024

		Crude Oil		
Country	**ISO**	**Percent total consumption imported**	**Percent of Imports from ME**	**Percent total Consumption from ME**
North America				
Canada	CAN	32.9	9.6	3.2
US	USA	46.2	8.1	3.7
Latin America				
Brazil	BRA	11.7	22.9	2.7
Europe				
France	FRA	73.4	11.3	8.3
Germany	DEU	81.1	7.7	6.2
Italy	ITA	91.7	14.9	13.6
United Kingdom	GBR	80.8	0.6	0.5
Asia Pacific				
Australia	AUS	18.0	5.8	1.1
China	CHN	73.2	44.3	32.4
India	IND	93.9	45.8	43.0
Indonesia	IDN	23.5	21.1	4.9
Japan	JPN	78.1	95.1	74.2
Malaysia	MYS	54.2	69.3	37.6
Philippines	PHL	29.6	95.5	28.3
South Korea	KOR	109.4	72.5	79.3

table continues

Table continues

		Refined Petroleum		
Country	**ISO**	**Percent total consumption imported**	**Percent of imports from ME**	**Percent total consumption from ME**
North America				
Canada	CAN	27.3	0.8	0.2
US	USA	11.4	11.9	1.4
Latin America				
Brazil	BRA	17.4	10.8	1.9
Europe				
France	FRA	60.5	33.8	20.5
Germany	DEU	33.7	4.6	1.5
Italy	ITA	25.0	41.8	10.5
United Kingdom	GBR	44.9	17.4	7.8
Asia Pacific				
Australia	AUS	99.4	1.4	1.4
China	CHN	6.4	18.7	1.2
India	IND	5.4	39.0	2.1
Indonesia	IDN	40.0	10.5	4.2
Japan	JPN	16.5	49.5	8.2
Malaysia	MYS	90.3	13.4	12.1
Philippines	PHL	66.5	3.3	2.2
South Korea	KOR	29.3	52.6	15.4

table continues

Table continues

		LNG		
Country	**ISO**	**Percent total consumption imported**	**Percent of imports from ME**	**Percent total consumption from ME**
North America				
Canada	CAN	0.3	0	0
US	USA	0.1	0	0
Latin America				
Brazil	BRA	9.5	0	0
Europe				
France	FRA	80.4	1.6	1.3
Germany	DEU	n.a.	n.a.	n.a.
Italy	ITA	24.7	45.6	11.3
United Kingdom	GBR	15.7	8.4	1.3
Asia Pacific				
Australia	AUS	n.a.	n.a.	n.a.
China	CHN	24.2	26.6	6.4
India	IND	54.0	57.8	31.2
Indonesia	IDN	n.a.	n.a.	n.a.
Japan	JPN	97.8	11.1	10.8
Malaysia	MYS	9.0	0	0
Philippines	PHL	n.a.	n.a.	n.a.
South Korea	KOR	99.9	30.3	30.3

n.a. = not applicable

Source: Energy Institute Statistical Review 2025; UN Comtrade, 2024. See page 12 for methodology and caveats.

Methodology and caveats

Source—Crude Oil	Consumption: Energy Institute Statistical Review of World Energy 2025 (oil consumption, tonnes, 2024). Trade: UN Comtrade, HS 2709 (Petroleum oils, crude), 2024.
Source—Refined Pet.	Consumption denominator: Energy Institute Statistical Review (total oil consumption, tonnes, 2024). Trade: UN Comtrade, HS 2710 (Petroleum oils, refined), 2024.
Source—LNG	Consumption: EI Statistical Review (gas consumption, bcm, 2024). LNG total imports: EI Statistical Review (gas, LNG imports bcm, 2024). LNG ME imports: EI Statistical Review (gas trade 2024, LNG); ME = Oman + Qatar + UAE + Yemen.
ME (Oil)	Saudi Arabia, Iraq, Iran, Kuwait, UAE, Qatar, Oman, Bahrain, Yemen.
ME (LNG)	Oman, Qatar, UAE, Yemen (only ME LNG exporters with material 2024 flows).
Indicator definitions	(a) % consumption imported = total imports / consumption. (b) % imports from ME = ME imports / total imports. (c) % consumption from ME = ME imports / consumption (= a*b).
Denominator note	Crude and refined indicators share the same denominator (total petroleum consumption in Mt) because the EI Statistical Review reports only one oil consumption series.
Total imports (Comtrade)	Computed as the sum across all reported partner countries (excluding the W00 "World" summary line). Several EU reporters list W00 as zero while reporting partner-level flows; summing partners gives the more reliable total.
Values above 100%	Refining/transit hubs (e.g. Singapore, South Korea, Israel) can show crude or refined imports in excess of domestic consumption. These flows are re-exported as refined products and are reported as imports by the customs authority of the hub.
LNG missing rows	Germany, Israel, South Africa, Australia, Indonesia, and Philippines are not listed individually in the EI „Gas - LNG imports bcm" sheet; their LNG cells are marked n.a.

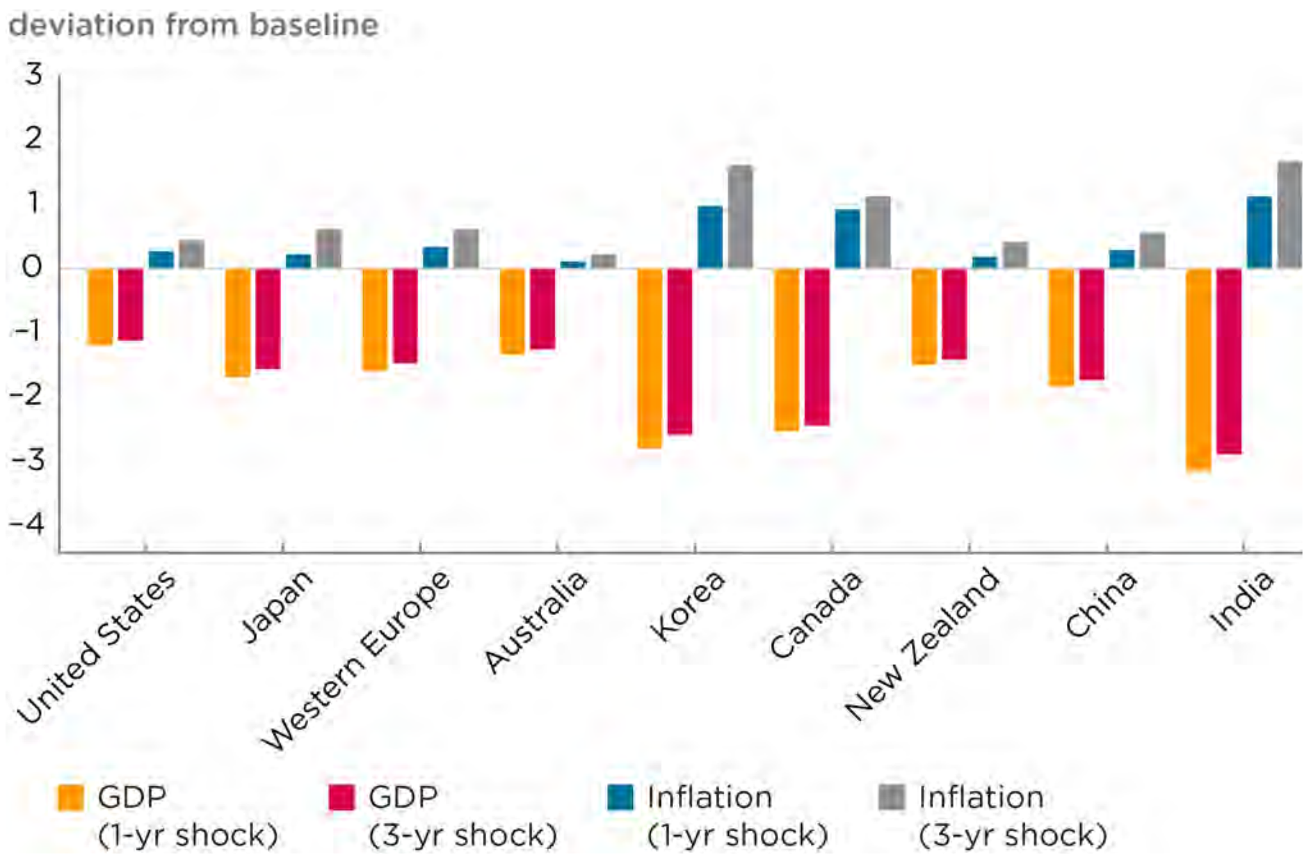
RESULTS

A full set of results for all countries, sectors, and macroeconomic variables is available in the online dashboard.

Figure 2

This year's war in the Middle East is projected to result in lower GDP and higher inflation than otherwise in 2026 in advanced economies, China, and India

Projected percent deviation from baseline for GDP; percentage point deviation for inflation; in two price shock scenarios



Note: Western Europe includes the United Kingdom.

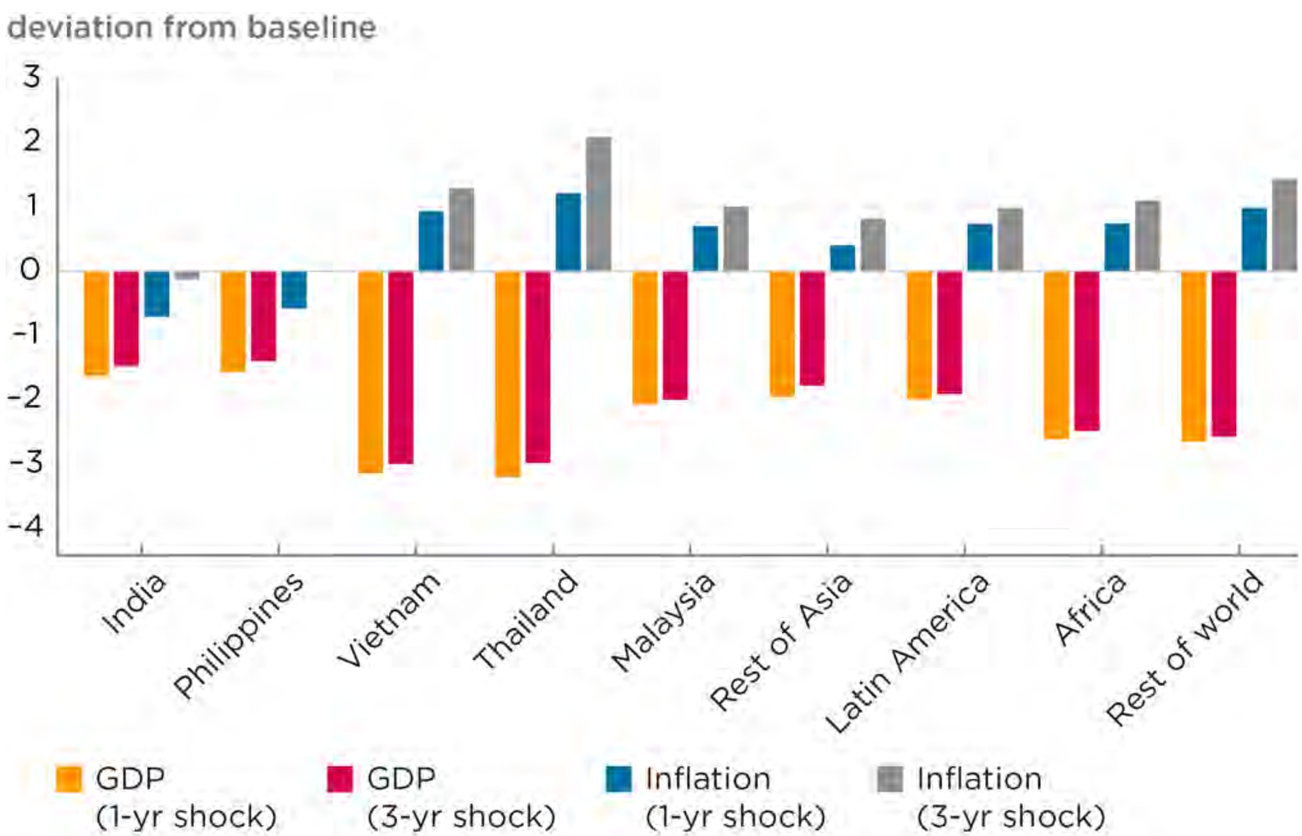
Source: G-Cubed. n.d. G-Cubed Model 12N. https://documentation.gcubed.com/gcubed/version/12N/#regions.

The results for GDP and inflation are shown in figure 2 (above) for the advanced economies as well as China and India. Figure 3 (page 14) shows GDP and inflation results for all other economies and regions except the Middle East and North Africa, due to the much bigger size of the shock in that region. We show the 2026 impact for both the temporary shock, which lasts only through 2026, and the persistent shock, which is equivalent in 2026 before fading out through 2027 and 2028.

Figure 3

This year's war in the Middle East is projected to result in lower GDP and higher inflation than otherwise in 2026 in emerging economies

Projected percent deviation from baseline for GDP; percentage point deviation for inflation; in two price shock scenarios



Source: G-Cubed. n.d. G-Cubed Model 12N. https://documentation.gcubed.com/gcubed/version/12N/#regions.

The war in the Middle East increases inflation and reduces GDP relative to baseline in all advanced economies. This is because oil, petroleum, and LNG are important inputs in many sectors. A rise in input prices increases costs. A rise in fertilizer costs increases agricultural prices and reduces demand. Both channels slow GDP growth. The resulting GDP reductions relative to baseline shown in figure 2 range in size from 1.2 percent for the United States to about 3 percent for India. The impact on India is exacerbated by the decline in agricultural production, driven by higher prices and reduced fertilizer availability. The scenario in which the shock is expected to taper over three years has a smaller impact on GDP in 2026 for several reasons. Primarily, real interest rates fall more in 2026 under the persistent shock scenario because the financial markets correctly anticipate the more drawn-out disruptions running into 2027 and 2028. Lower real interest rates in 2026 reduce the negative impact on GDP from the energy shock.

China is the world's largest importer of crude oil but has less dependence on the Middle East relative to total use than Korea and Japan; hence the smaller impact on China relative to Korea and Japan.[8] The impacts on GDP in emerging countries tend to be larger than in advanced economies because fertilizers have a larger impact on agricultural production, which is a larger share of the economy.

The impact on inflation varies across economies. The shocks to energy prices and fertilizers are both supply shocks, reducing inputs (increasing input costs) as well as demand shocks (reducing real wages, incomes, and wealth on consumption and reducing the return on capital). The more energy-intensive an economy's production, the greater the impact of an energy price shock on input costs. The more labor-intensive the economy, the less the shock passes through into inflation in 2026 because nominal wages are assumed to be fixed in 2026 before adjusting to expected inflation and labor market strength from 2027. The supply shock tends to dominate in most economies, leading to higher inflation. Exceptions are the Philippines and Indonesia, where overall inflation initially falls slightly due to a substantial decline in real consumption from higher agricultural prices. The other exceptions are the countries of the Middle East and North Africa, some of which suffer deaths and other human costs of war in addition to severe damage to their economies. The effects in that region include GDP drops of at least 12 percent from baseline and sharp inflation surges in both scenarios.

Within economies, impacts across sectors vary widely depending on the structure of production and the production

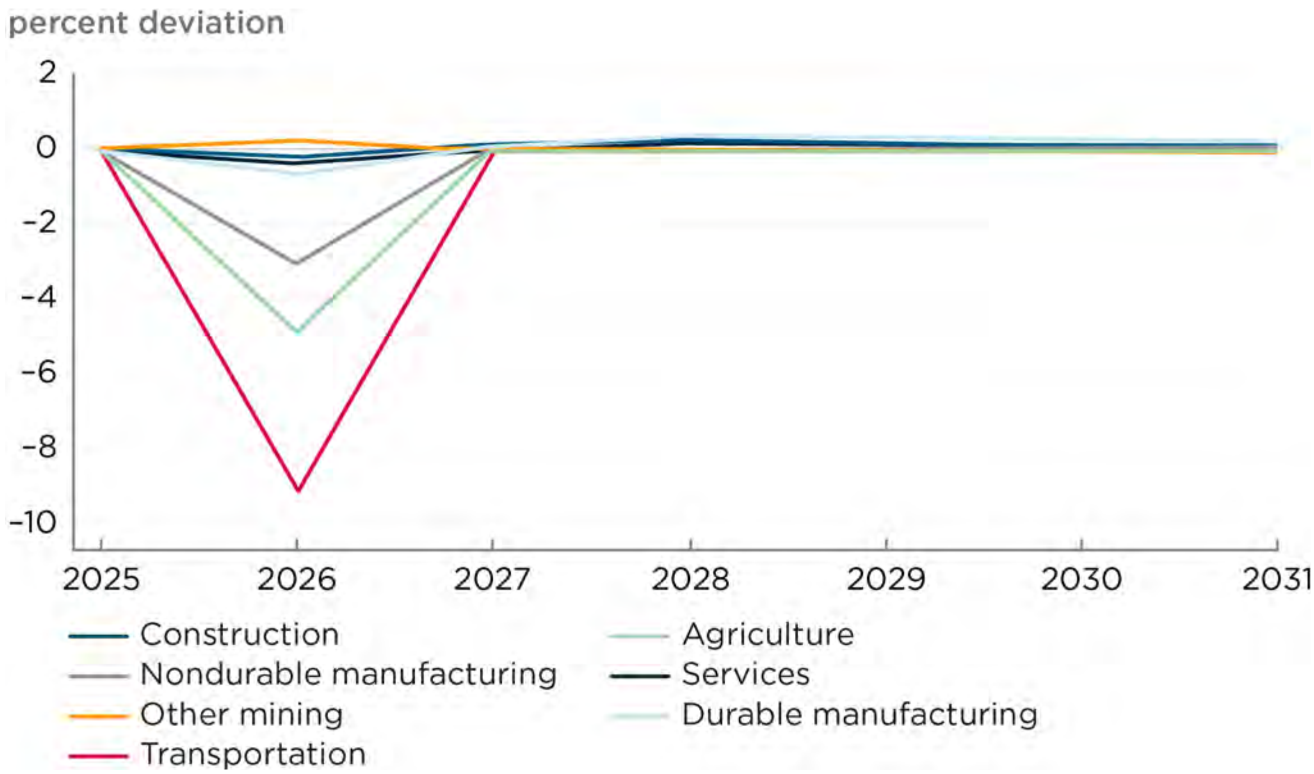
8 According to the US Energy Information Administration (2026), China maintains stocks of approximately 1.4 billion barrels of crude oil, by far the world's largest, equivalent to roughly three months of domestic consumption. It is conceivable that it could deploy these reserves to dampen the impacts estimated in the model, but it is unlikely over the full-year horizon of the model results.

linkages between and within countries. A full set of results is contained in the online dashboard.

Figure 4

A one-year energy price shock is projected to cause lower US domestic production than otherwise by most non-energy sectors in 2026

Projected percent deviation from baseline, by sector, 2025–2031



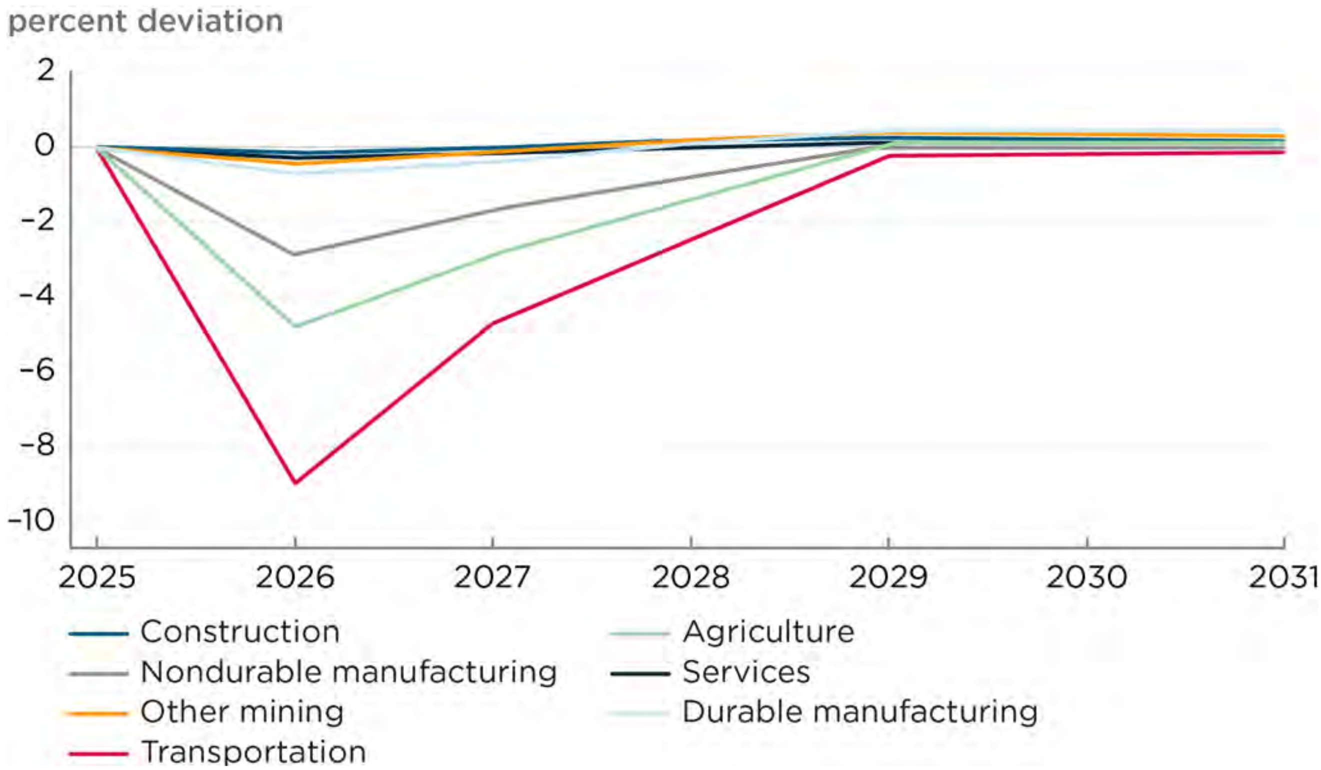
Source: G-Cubed. n.d. G-Cubed Model 12N. https://documentation.gcubed.com/gcubed/version/12N/scenarios/Middle_East_war/2026-04-20/temporary_disruptions.html.

Figures 4 (above) and 5 (page 17) show the sectoral impacts for the United States under the one-year scenario and the more persistent three-year scenario, respectively. The most affected US sector is transportation, followed by agriculture and nondurable manufacturing. This is not surprising given the importance of energy as an input in transportation and agriculture, and the importance of fertilizers as an input in agriculture. The output decline in these sectors reflects both higher input costs and a fall in demand due to rising prices for their output. The more persistent the shock, the longer the output decline in nonenergy sectors. Even though the United States is a net energy exporter and has significant supplies of oil and LNG, it is not immune to the global energy price shock because oil and gas prices are determined in a global market and US industry and households pay global prices for these energy sources.

Figure 5

A three-year energy price shock is projected to cause lower US domestic production than otherwise by most non-energy sectors over time

Projected percent deviation from baseline, by sector, 2025–2031



Source: G-Cubed. n.d. G-Cubed Model 12N. https://documentation.gcubed.com/gcubed/version/12N/scenarios/Middle_East_war/2026-04-20/persistent_disruptions.html.

CONCLUSION

There are several key lessons to be learned from the two different scenarios for the global economy. The war in the Middle East is a large negative supply shock, but this also creates a demand shock by reducing incomes and wealth. In combination, these supply and demand shocks alter trading patterns and production structures and change the allocation of global capital. Countries are affected differently depending on their reliance on energy, particularly on different types of energy in their production structures and whether their energy is sourced from the disrupted Middle East. Also, emerging economies with agriculture accounting for a larger share of GDP are particularly hard hit due to higher fertilizer prices and lower availability.

The longer the disruption to global energy markets persists, the greater the economic costs over time, though an expectation of weaker future growth can reduce the fall in GDP in 2026 by lowering real interest rates in anticipation of the persistent slowdown. The damage is accentuated in energy-dependent economies with limited energy endowments and in emerging economies that rely on fertilizers for agricultural production.

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APPENDIX A

DETAILS OF THE G-CUBED MODEL

Model documentation and detailed equations are available on the G-Cubed website.

Table A.1

Overview of the G-Cubed model version 12N

Countries (13)	Regions (6)
United States	Western Europe
Japan	Rest of Asia
Australia	Latin America
South Korea	Africa
Canada	Middle East and North Africa
New Zealand	Rest of world
China	**Sectors (12)**
India	Electricity delivery
Indonesia	Gas extraction and utilities
Philippines	Petroleum refining
Vietnam	Coal mining
Thailand	Crude oil extraction
Malaysia	Construction
	Other mining
	Agriculture
	Durable manufacturing
	Nondurable manufacturing
	Transportation
	Services

The G-Cubed model has a number of features that are particularly important for modeling the impact of energy shocks on the global economy. First, the model accounts for stocks and flows of physical and financial assets. For example, budget deficits accumulate into government debt and current account deficits accumulate into foreign debt. The model imposes intertemporal budget constraints on all households, firms, governments, and countries. Thus, a long-run stock equilibrium is obtained through the adjustment of asset prices, such as the interest rate for government fiscal positions or real exchange rates for the balance of payments. However, the adjustment toward the long-run equilibrium of each economy can be slow, occurring over decades.

Second, firms and households in the model use money issued by central banks for all

transactions. Thus, central banks set short-term nominal interest rates to target macroeconomic outcomes such as inflation, unemployment, and exchange rates based on the Henderson-McKibbin-Taylor monetary rules (Henderson and McKibbin 1993; Taylor 1993). These rules approximate actual monetary regimes in each country or region, tying down their long-run inflation rates and allowing for short-term policy adjustments to smooth out fluctuations in the real economy.

Third, nominal wages are sticky, adjusting over time based on country-specific labor-contracting assumptions. Firms in each sector hire labor up to the point that the marginal product of labor equals the real wage in that sector, where the real wage is defined in terms of the wage relative to the output price level of that sector. Any excess labor enters a pool of unemployed workers. Unemployment—or alternatively, labor shortages—cause the nominal wage to adjust to clear the labor market in the long run. In the short run, unemployment can arise due to structural supply shocks or changes in aggregate demand in the economy.

Fourth, rigidities prevent the economy from moving quickly from one equilibrium to another. These rigidities include the nominal stickiness of wages mentioned above as well as the slow adjustment of sector-specific capital stocks due to convex adjustment costs in investment in each sector-specific capital stock. The transition path is also influenced by a lack of complete foresight in expectation formation among monetary and fiscal authorities, who adhere to specific monetary and fiscal rules. Short-run adjustments to economic shocks can differ significantly from long-run equilibrium outcomes. Modeling short-run rigidities is essential for capturing the impact, over the business cycle, of a significant shock.

Fifth, the model features heterogeneous households and firms. Firms are modeled separately within each sector. There are two types of consumers in the economy, and two types of firms within each sector in each country or region. One group of consumers and firms bases its decisions on forward-looking expectations, using the model's solution in future periods to form those expectations. The other group follows simple rules of thumb, which are optimal in the long run but do not update their information on expected future shocks.

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